CUSTOMER NO.: 38107

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of W. ALI	)	Examiner: L. BEHRINGER
	)	Art Unit: 3766
Serial No.: 10/568,173	)	Confirmation: 6165
Filed: February 10, 2006	)	
For: **A SYSTEM AND METHOD FOR DETECTING SIGNAL ARTIFACTS**	)	
Date of Final Office Action: November 21, 2008	)	
Attorney Docket No.: PHUS030273US2/PKRZ201286	)	Cleveland, OH 44114 March 13, 2009

BRIEF ON APPEAL

CERTIFICATE OF ELECTRONIC TRANSMISSION

I certify that this **BRIEF ON APPEAL** and accompanying documents in connection with U.S. Serial No. 10/568,173 is being filed on the date indicated below by electronic transmission with the United States Patent and Trademark Office via the electronic filing system (EFS-Web).

March 17 2009
Date

Patricia A Heim
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I. STATEMENT OF REAL PARTY IN INTEREST (41.37(f))

The real party in interest for this appeal and the present application is Koninklijke Philips Electronics, N.V.

II. STATEMENT OF RELATED CASES (41.37(g))

None

III. JURISDICTIONAL STATEMENT (41.37(h))

The Board has jurisdiction under 35 U.S.C. 134(a).

The Examiner mailed a final rejection on November 21, 2008, setting a three-month shortened statutory period for response.

The time for responding to the final rejection expired on February 1, 2009. Rule 134.

A notice of appeal was filed on January 20, 2009.

The time for filing an appeal brief expires on March 20, 2009.

The appeal brief is being filed on the date set forth on the Certificate of Transmission.

IV. TABLE OF CONTENTS (41.37(i))

V. TABLE OF AUTHORITIES (41.37(j))

None.

VI. STATUS OF AMENDMENTS (41.37(l))

No amendments were filed subsequent to the November 21, 2008 final rejection.

Amendment D is being filed concurrently herewith to preemptively address issues which may arise due to *In re Bilski*. It is not known whether the Examiner will enter Amendment D.

VII. GROUNDS OF REJECTION TO BE REVIEWED (41.37(m))

Whether claims 1-3, 7-9, 11, and 12 are patentable in the sense of 35 U.S.C. § 103 over Snyder (US 6,287,328).

Whether claims 4-6 and 10 are patentable in the sense of 35 U.S.C. § 103 over Snyder, in view of Stadler (US 6,397,100).

Whether claims 13-15 are anticipated by Snyder.

Whether claims 13 and 16 are anticipated by Stadler.

VII. STATEMENT OF FACTS (41.37(n))

1. The Examiner referred the Applicant to column 7, lines 45-63 of Snyder, particularly lines 45 and 46 which state "the method of correlating the data can be in a correlation method known in the art" (final rejection of November 21, 2008, page 2, paragraph 4).

2. Claim 1 calls for a global correlation. Snyder at column 7, lines 45-63 referenced by the Examiner does not disclose a global correlation matrix.

3. Claim 1 calls for a local correlation matrix. Snyder, including column 7, lines 45-63 referenced by the Examiner, do not disclose a local correlation matrix.

4. Claim 1 calls for a correlation vector. Snyder, including column 7, lines 45-63 referenced by the Examiner, do not disclose a correlation vector.

5. Claim 1 calls for an average of the correlation vector. Snyder, including column 7, lines 45-63 referenced by the Examiner, does not disclose an average of a correlation vector.

6. Claim 1 calls for determining whether an artifact was detected in one of the at least two signals from the correlation vector and the average. Snyder, including column 7, lines 45-63 referenced by the Examiner, do not disclose detecting an artifact in this manner.

7. Snyder at column 8, lines 51-54 calls for the process to be performed as described in more detail in co-pending application 08/755,283 which matured into Lyster (US 5,902,249).

8. In the final rejection of November 21, 2008 on page 2, paragraph 4, the Examiner for the first time cites and asserts that Kaib (US 5,944,669) performs a correlation method known in the art.

9. Kaib, at column 9, lines 15-32 and Figure 3c discusses a correlation test block 47 discusses a correlation technique which determines a ratio of a single lead to complex lead correlations over a preset programmable time window.

10. In the final rejection of November 21, 2008, page 2, paragraph 5, the Examiner in the alternative asserts that Escalona (US 5,694,942) at column 3, line 44 - column 4, line 9 might be considered as faith in a correlation method known in the art referenced at column 7, lines 45 and 46 of Snyder.

11. Escalona at column 3, line 44 - column 4, line 9 describes an attractor trajectory which is a discreet 3D curve in which points correspond to the sampling interval in each ECG lead with N time intervals, end points on the curve are calculated and the distances evaluated.

12. The matrix of differences and the other calculations described in column 3, line 40 - column 4, line 9 of Escalona, like Snyder, fails to

disclose: (1) a global correlation matrix, (2) a local correlation matrix, (3) a correlation vector, (4) an average of the correlation vector, or (5) determining whether an artifact was detected in one of the at least two signals from the correlation vector and the average.

13. In the November 21, 2008 final rejection, the Examiner refers the Applicant to the rejection of claim 1 which, in turn, refers the reader to column 4, lines 24-41 of Snyder.

14. Column 4, lines 24-41 of Snyder disclose correlators for comparing the detected event signal with each of the detected non-event signals to produce respective correlation signals which are analyzed by an inference processor.

15. The Examiner only cites Stadler as teaching the use of an alarm indicator (November 21, 2008 final rejection, page 5, paragraph 12).

16. On page 4, paragraph 10 of the final rejection of November 21, 2008, the Examiner refers the Applicant to column 4, lines 24-41 of Snyder.

17. Snyder at column 4, lines 24-41 discloses comparing a detected event signal with each detected non-event signal to produce respective correlation signals. There is no disclosure of determining a global correlation nor of determining a local correlation, much less a global correlation over a longer time period and a local correlation over a shorter time period.

18. Column 4, lines 36-38 of Snyder call for comparing an event signal with a non-event signal.

19. The final rejection of November 21, 2008 on page 3, paragraph 7, asserts that these limitations are found in column 4, lines 24-41 of Snyder.

20. Snyder at column 4, lines 37-41 calls for:

> correlators for comparing the detected event signal with each of the detected non-event signals to produce respective correlation signals.

21. Snyder discloses correlators 122, 124, and 126 at column 7, lines 38-54, which perform correlation methods including cross-correlation techniques which include known mathematical functions as well as processes that effectively correlates the data, including finite sampled or continuous estimates of cross-covariants and cross-correlation, both biased and unbiased or a comparison between any of multiple signals. The correlators of Snyder are not disclosed by Snyder as being means for determining a global correlation for at least two event signals over a first period of time or a means for determining a local correlation for the at least two event signals over a second period of time which is shorter than the first.

22. Snyder at column 4, lines 36-38 and column 7, lines 38-54 discloses correlators but does not describe a correlation vector, a global

correction vector, determining a deviation between a local correlation vector and a global correlation vector, or for determining average deviation.

23. In the June 2, 2008 final rejection on page 2 in paragraph 2, the Examiner refers the Applicant to column 17, lines 32-67 and Figure 7 of Stadler.

24. Stadler at column 17, lines 32-67 and Figure 7 describes locating the features of primary importance such as the R-peak, the isoelectric point, and the ST segment.

25. Stadler at column 17, lines 32-67 referenced by the Examiner analyzes the PQRST waveform of an individual cardiac cycle and does not correlate two event signals, determine a deviation between local and global correlation vectors, or determine an average of such deviation.

26. Stadler, at column 17, lines 65-67 compares characteristic values of an individual waveform with expected ranges.

IX. ARGUMENT (41.37(o))

A. Claims 1, 2, 3, 5, and 6 are Patentable Over Snyder

Claim 1 sets forth a device which includes a controller which performs and improved correlation technique. The Applicant asserts and it is believed that the Examiner concurs that this technique is not set forth in Snyder. In response to queries regarding how Snyder performs the specified analysis, the Examiner referred the Applicant to column 7, lines 45-63 of Snyder, particularly lines 45 and 46 which state "the method of correlating the data can be in a correlation method known in the art" (final rejection of November 21, 2008, page 2, paragraph 4).

Claim 1 calls for a global correlation matrix. Snyder at column 7, lines 45-63 referenced by the Examiner does not disclose a global correlation matrix.

Claim 1 further calls for a local correlation matrix. Snyder, including column 7, lines 45-63 referenced by the Examiner, does not disclose a local correlation matrix.

Claim 1 calls for a correlation vector. Snyder, including column 7, lines 45-63 referenced by the Examiner, does not disclose a correlation vector.

Claim 1 calls for an average of the correlation vector. Snyder, including column 7, lines 45-63 referenced by the Examiner, does not disclose an average of a correlation vector.

Claim 1 calls for determining whether an artifact was detected in one of the at least two signals from the correlation vector and the average. Snyder, including column 7, lines 45-63 referenced by the Examiner, does not disclose detecting an artifact in this manner.

Indeed, as pointed out to the Examiner in Amendment C, Snyder at column 8, lines 51-54 calls for the process to be performed as described in more detail in co-pending application 08/755,283 which matured into Lyster (US 5,902,249). Amendment C also pointed out to the Examiner that Lyster also fails to disclose any of the above enumerated deficiencies of Snyder. Because the Examiner has not made Lyster of record, it is understood that the Examiner concurs that Lyster does not cure the above enumerated shortcomings of Snyder and that the Examiner does not deem Lyster to be material to the examination of the present application.

In the final rejection of November 21, 2008 on page 2, paragraph 4, the Examiner for the first time cites and asserts that Kaib (US 5,944,669) performs a correlation method "known in the art" implying that Kaib is a/the referenced correlation methods "known in the art" in column 7, lines 45 and 46 of Snyder. Even if the citation of Kaib is

intended to be a rejection of claim 1 under 35 U.S.C. § 103 over Snyder as modified by Kaib, the combination still does not meet the limitations of claim 1. Kaib, at column 9, lines 15-32 and Figure 3c discusses a correlation test block 47 discusses a correlation technique which determines a ratio of a single lead to complex lead correlations over a preset programmable time window. When the calculated ratio average exceed a threshold 60, invalidity is indicated. Again, Kaib, like Snyder, fails to disclose: (1) a global correction matrix, (2) a local correction matrix, (3) a correlation vector, (4) an average of the correlation vector, or (5) determining whether an artifact was detected on one of at least two signals from the correlation vector and the average. Because Snyder and Kaib both suffer the same shortcomings, it is submitted that Kaib fails to cure the shortcomings of Snyder.

In the final rejection of November 21, 2008, page 2, paragraph 5, the Examiner in the alternative asserts that Escalona (US 5,694,942) at column 3, line 44 - column 4, line 9 might be considered as a/the correlation method "known in the art" referenced at column 7, lines 45 and 46 of Snyder. However, this section of Escalona fails to cure the shortcomings of Snyder. This section of Escalona describes an attractor trajectory which is a discreet 3D curve in which points correspond to the sampling interval in each ECG lead with N time intervals and points on the curve are calculated and the distances evaluated. Unlike Snyder,

Kaib, and Lyster, Escalona does disclose a matrix. Specifically, Escalona expresses the different calculations in matrix format. However, the matrix of differences and the other calculations described in column 3, line 40 - column 4, line 9 of Escalona, like Snyder, fails to disclose: (1) a global correlation matrix, (2) a local correlation matrix, (3) a correlation vector, (4) an average of the correlation vector, or (5) determining whether an artifact was detected in one of the at least two signals from the correlation vector and the average. Because Escalona and Snyder both have these same enumerated deficiencies relative to claim 1, it is submitted that Snyder modified by Escalona fail to teach or fairly suggest the limitations of claim 1.

The Examiner directs the Applicant's attention to column 4, lines 24-41 of Snyder. This portion of the Summary of the Invention discloses that Snyder has an embodiment which includes an apparatus for detecting corruption of an event signal. The referenced section of Snyder does not cure the defects discussed above. Moreover, the Examiner points to no areas of the Detailed Description of Snyder which sets forth the details of this detection corruption apparatus. Indeed, for the reasons set forth above, it is submitted that no portion of the detailed description of Snyder cures the five defects discussed above.

Accordingly, it is submitted that claim 1 and claims 2, 3, 5, and 6 dependent therefrom distinguish patentably and unobviously over the references of record.

B. Claim 4 Distinguishes Patentably Over Snyder as Modified by Stadler

Claim 4 calls for a controller which determines whether an artifact is detected by:

(1) repeatedly determining a global correlation for the at least two event signals over a first period of time,

(2) repeatedly determining a local correlation for the at least two event signals over a second period of time which is shorter than the first period of time,

(3) repeatedly determining a current deviation between the local correlation and the global correlation,

(4) determining an average deviation of a plurality of the current deviations, and

(5) determining whether an artifact was detected in one of the at least two event signals based on a difference between the current deviation and the average deviation.

As discussed above, Snyder fails to disclose or fairly suggest these five limitations. The Examiner directs the Applicant's attention to column 6, lines 5-8 of Snyder. This section of Snyder discloses

comparing a correlated signal to a threshold value. Such a threshold comparison fails to disclose or render obvious any of the above five enumerated limitations of claim 4. In the November 21, 2008 final rejection, the Examiner refers the Applicant to the rejection of claim 1 which, in turn, refers the reader to column 4, lines 24-41 of Snyder. Column 4, lines 24-41 of Snyder merely discloses correlators for comparing the detected event signal with each of the detected non-event signals to produce respective correlation signals which are analyzed by an inference processor. Such a generalized recitation fails to disclose or render obvious the above five detailed steps of the presently claimed improved artifact detection.

Stadler does not cure these shortcomings of Snyder. The Examiner only cites Stadler as teaching the use of an alarm indicator (November 21, 2008 final rejection, page 5, paragraph 12). The Examiner does not assert and indeed Stadler does not cure any of the above five enumerated shortcomings of Snyder.

Accordingly, it is submitted that claim 4 distinguishes patentably and unobviously over the references of record.

C. Claims 7-12 Distinguish Patentably Over the References of Record

Claim 7 calls for the steps of:

(1) determining a global correlation for at least two received event signals over a first period of time;

(2) determining a local correlation for the at least two even signals over a second period of time which is shorter than the first period of time;

(3) repeatedly determining a current deviation between the local correlation and the global correlation;

(4) determining an average deviation from a plurality of the current deviations; and

(5) comparing the current deviation and the average deviation to determine whether an artifact was detected in one of the at least two event signals.

On page 4, paragraph 10 of the final rejection of November 21, 2008, the Examiner refers the Applicant to column 4, lines 24-41 of Snyder. This section of Snyder discloses comparing a detected event signal with each detected non-event signal to produce respective correlation signals. There is no disclosure of determining a global correlation nor of determining a local correlation, much less a global correlation over a longer time period and a local correlation over a shorter

time period. Nor does this or other sections of Snyder disclose determining a current deviation between such a local correlation and global correlation. Nor does this or other sections of Snyder disclose determining an average deviation from a plurality of the current deviations. Nor does this or other sections of Snyder disclose comparing the current deviation and the average deviation to determine whether or not artifact is detected. To the contrary, column 4, lines 36-38 of Snyder call for comparing an event signal with a non-event signal. Accordingly, it is submitted that Snyder teaches against the presently claimed signal artifact detection technique in favor of a different technique. Because Snyder specifically teaches against the above enumerated five steps in favor of a different corruption detection technique which works in a different way than the presently claimed improved technique and because the present provides improved artifact differentiation relative to Snyder, it is submitted that claim 7 and claims 8-12 dependent therefrom distinguish patentably and unobviously over Snyder.

D. Claims 13-16 are Not Anticipated by Snyder

Claim 13 calls for (1) a means for determining a global correlation for at least two event signals over a first period of time and (2) a means for determining a local correlation for the at least two event signals over a second period of time which is shorter than the first period of time. The final rejection of November 21, 2008 on page 3, paragraph

7, asserts that these limitations are found in column 4, lines 24-41 of Snyder. To the contrary, Snyder at column 4, lines 37-41 calls for:

> correlators for comparing the detected event signal with each of the detected non-event signals to produce respective correlation signals

A correlator which compares an event signal with a non-event signal is not a means for determining a global correlation for at least two event signals nor is it a means for determining a local correlation for the at least two event signals. Most certainly, the correlator described by Snyder does not determine a global correlation for at least two event signals over a first, longer period of time and a local correlation for the at least two event signals over a second, shorter period of time. Snyder discloses correlators 122, 124, and 126 at column 7, lines 38-54. However, these correlators are disclosed as performing correlation methods including cross-correlation techniques which include known mathematical functions as well as processes that effectively correlates the data, including finite sampled or continuous estimates of cross-covariants and cross-correlation, both biased and unbiased or a comparison between any of multiple signals. Thus, the correlators of Snyder are not disclosed by Snyder as being a means for determining a global correlation for at least two event signals over a first period of time or a means for determining a

local correlation for the at least two event signals over a second period of time which is shorter than the first.

Claim 13 also calls for: (3) a means for determining a deviation between a local correlation vector and a global correlation vector and (4) a means for determining an average deviation from the deviation. Again, Snyder at column 4, lines 36-38 and column 7, lines 38-54 discloses correlators but does not describe a correlation vector, a global correction vector, determining a deviation between a local correlation vector and a global correlation vector, or for determining average deviation.

Claim 13 also calls for: (4) a means for determining whether an artifact was detected in one of the at least two event signals based on the average deviation. Although Snyder does determine whether an artifact is present, Snyder generates no average deviation as described in claim 13 and hence cannot determine whether an artifact was detected based on such average deviation.

Because Snyder fails to disclose all of the limitations of claim 13, it is submitted that claim 13 and claims 14-16 are not anticipated by Snyder.

E. Claims 13 and 16 are Not Anticipated by Stadler

In the June 2, 2008 final rejection on page 2 in paragraph 2, the Examiner refers the Applicant to column 17, lines 32-67 and Figure 7 of Stadler. This section of Stadler describes locating the features of primary importance such as the R-peak, the isoelectric point, and the ST segment of a cardiac cycle. The R-R interval is taken, the R slope is figured, and a value is determined for the noise in the isoelectric segment. The slope of the ST segment is found and a parameter called ST change is found along with the R-wave amplitude. A determine is made whether there has been an axis shift in the vectorized ECG waveforms.

Stadler also discloses marking the sample coincident in time with a VS event of the PQRST complex. That is, when a VS event is recognized, a group of samples are stored before the event and a larger group of samples are stored after the event. Thus, Stadler is determining the presence of artifacts based on the characteristics of the cardiac signal. The section of Stadler referenced by the Examiner does not disclose: (1) a means for determining a global correlation of at least two event signals over a first period of time, (2) determining a local correlation of the at least two event signals over a second period of time which is shorter than the first. By distinction, Stadler takes sixteen samples before an event and forty samples after an event and makes no suggestion of using these

samplings to determine either a global or a local correlation, much less both. Stadler does not compare VS event signals with each other. The second sampling time of Stadler is longer, not shorter than the first sampling time.

Claim 13 further calls for: (3) determining a deviation between a local correlation vector and a global correlation vector and (4) a means for determining an average deviation. The portion of Stadler referenced by the Examiner analyzes the PQRST waveform of an individual cardiac cycle and does not correlate two event signals, does not determine a deviation between local and global correlation vectors, and does not determine an average of such deviation.

Claim 13 also calls for: (5) a means for determining whether an artifact was detected in one of the at least two signals based on the average deviation. By contrast, Stadler, at column 17, lines 65-67 compares characteristic values of an individual waveform with expected ranges.

Because Stadler does not disclose every limitation of claim 13, it is submitted that claim 13 and claim 16 dependent therefrom are not anticipated by Stadler.

F. CONCLUSION

For the reasons set forth above, it is submitted that claims 1-16 are not anticipated by and are patentable over the references of record. An early decision reversing the Examiner's rejections of claims 1-16 is requested.

Respectfully submitted,

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APPENDIX

X. CLAIMS SECTION (41.37(p))

A. With the Amendment D accompanying the Appeal Brief entered

1. (Rejected) A device comprising:

a controller;

a memory coupled to the controller; and

an input interface which receives at least two event signals,

wherein the controller determines:

a global correlation matrix for the at least two event signals over a first period of time,

a local correlation matrix for the at least two event signals over a second period of time which is shorter than the first period of time,

a correlation vector indicative of a deviation between the local correlation matrix and the global correlation matrix,

an average of the correlation vector, and

whether an artifact was detected in one of the at least two event signals from the correlation vector and the average of the correlation vector.

2. (Rejected) The device according to Claim 1 wherein said device is a patient monitoring system.

3. (Rejected) The device according to Claim 2 wherein said at least two event signals are monitored patient data signals.

4. (Rejected) A patient monitoring system comprising:

a controller;

a memory coupled to the controller;

an input interface configured to receive at least two event signals, the at least two event signals being patient monitored data signals;

wherein the controller determines whether an artifact is detected by:

repeatedly determining a global correlation for the at least two event signals over a first period of time,

repeatedly determining a local correlation for the at least two event signals over a second period of time which is shorter than the first period of time,

repeatedly determining a current deviation between the local correlation and the global correlation,

determining an average deviation of a plurality of the current deviations, and

determining whether an artifact was detected in one of the at least two event signals based on a difference between the current deviation and the average deviation; and

an alarm indicator coupled to the controller, the alarm indicator being triggered if at least one of the event signals crosses a preset threshold value and the controller determines that no artifact was detected in the at least one event signal.

5. (Rejected) The device according to Claim 1 further comprising a memory for recording the at least two event signals.

6. (Rejected) The device according to Claim 1, wherein said device includes a server forming part of a client-server network.

7. (Rejected) A method for detecting a signal artifact in event signals, the method comprising the steps of:

receiving at least two event signals;

determining a global correlation for the at least two event signals over a first period of time;

determining a local correlation for the at least two event signals over a second period of time which is shorter than the first period of time;

repeatedly determining a current deviation between the local correlation and the global correlation;

determining an average deviation from a plurality of the determined current deviations;

comparing the current deviation and the average deviation to determine whether an artifact was detected in one of the at least two event signals; and

triggering an alarm indication in response determining that an artifact was detected.

8. (Rejected) The method according to Claim 7 wherein said method is used with a patient monitoring system.

9. (Rejected) The method according to Claim 8 wherein said at least two event signals are monitored patient data signals.

10. (Rejected) The method according to Claim 9, said method further comprising the step of:

providing the alarm indication in response to at least one of the event signals crossing a preset threshold value and no artifact was detected in the at least one event signal.

11. (Rejected) The method according to Claim 7, said method further comprising the step of:

recording the at least two event signals.

12. (Rejected) The method according to Claim 7, wherein said method is used in a server forming part of a client-server network.

13. (Rejected) A system for detecting a signal artifact in an event signal, comprising:

means for receiving at least two event signals;

means for determining a global correlation for the at least two event signals over a first period of time;

means for determining a local correlation for the at least two event signals over a second period of time which is shorter than the first period of time;

means for determining a deviation between a local correlation vector and a global correlation vector;

means for determining an average deviation from the deviation; and

means for determining whether an artifact was detected in one of the at least two event signals based upon the average deviation.

14. (Rejected) The system according to Claim 13 wherein said system is a patient monitoring system.

15. (Rejected) The system according to Claim 14 wherein said at least two event signals are patient monitored data signals.

16. (Rejected) The system according to claim 13 further including:

means for monitoring at least one physiological parameter of a patient and generating the at least two event signals, said at least two event signals conveying patient physiological parameter data.

B. Without the Amendment D entered

1. (Rejected) A device comprising:

a controller;

a memory coupled to the controller; and

an input interface which receives at least two event signals,

wherein the controller determines:

a global correlation matrix for the at least two event signals over a first period of time,

a local correlation matrix for the at least two event signals over a second period of time which is shorter than the first period of time,

a correlation vector indicative of a deviation between the local correlation matrix and the global correlation matrix,

an average of the correlation vector, and

whether an artifact was detected in one of the at least two event signals from the correlation vector and the average of the correlation vector.

2. (Rejected) The device according to Claim 1 wherein said device is a patient monitoring system.

3. (Rejected) The device according to Claim 2 wherein said at least two event signals are monitored patient data signals.

4. (Rejected) A patient monitoring system comprising:

a controller;

a memory coupled to the controller;

an input interface configured to receive at least two event signals, the at least two event signals being patient monitored data signals;

wherein the controller determines whether an artifact is detected by:

repeatedly determining a global correlation for the at least two event signals over a first period of time,

repeatedly determining a local correlation for the at least two event signals over a second period of time which is shorter than the first period of time,

repeatedly determining a current deviation between the local correlation and the global correlation,

determining an average deviation of a plurality of the current deviations, and

determining whether an artifact was detected in one of the at least two event signals based on a difference between the current deviation and the average deviation; and

an alarm indicator coupled to the controller, the alarm indicator being triggered if at least one of the event signals crosses a preset threshold value and the controller determines that no artifact was detected in the at least one event signal.

5. (Rejected) The device according to Claim 1 further comprising a memory for recording the at least two event signals.

6. (Rejected) The device according to Claim 1, wherein said device includes a server forming part of a client-server network.

7. (Rejected) A method for detecting a signal artifact in event signals, the method comprising the steps of:

receiving at least two event signals;

determining a global correlation for the at least two event signals over a first period of time;

determining a local correlation for the at least two event signals over a second period of time which is shorter than the first period of time;

repeatedly determining a current deviation between the local correlation and the global correlation;

determining an average deviation from a plurality of the determined current deviations; and

comparing the current deviation and the average deviation to determine whether an artifact was detected in one of the at least two event signals.

8. (Rejected) The method according to Claim 7 wherein said method is used with a patient monitoring system.

9. (Rejected) The method according to Claim 8 wherein said at least two event signals are monitored patient data signals.

10. (Rejected) The method according to Claim 9, said method further comprising the step of:

providing an alarm indication in response to at least one of the event signals crossing a preset threshold value and no artifact was detected in the at least one event signal.

11. (Rejected) The method according to Claim 7, said method further comprising the step of:

recording the at least two event signals.

12. (Rejected) The method according to Claim 7, wherein said method is used in a server forming part of a client-server network.

13. (Rejected) A system for detecting a signal artifact in an event signal, comprising:

means for receiving at least two event signals;

means for determining a global correlation for the at least two event signals over a first period of time;

means for determining a local correlation for the at least two event signals over a second period of time which is shorter than the first period of time;

means for determining a deviation between a local correlation vector and a global correlation vector;

means for determining an average deviation from the deviation; and

means for determining whether an artifact was detected in one of the at least two event signals based upon the average deviation.

14. (Rejected) The system according to Claim 13 wherein said system is a patient monitoring system.

15. (Rejected) The system according to Claim 14 wherein said at least two event signals are patient monitored data signals.

16. (Rejected) The system according to claim 13 further including:

means for monitoring at least one physiological parameter of a patient and generating the at least two event signals, said at least two event signals conveying patient physiological parameter data.

APPENDIX (Continued)

XI. CLAIM SUPPORT AND DRAWING ANALYSIS SECTION (41.37(r))

1. (Previously Presented) A device (10) comprising:

a controller; **{21; p. 3, l. 31; Fig. 1}**

a memory coupled to the controller; and **{22; p. 4, l. 28-29; Fig. 1}**

an input interface which receives at least two event signals, **{11; 20; p. 3, l. 29-p. 4, l. 2; Fig. 1}**

wherein the controller {21} determines: **{p. 5, l. 1-5}**

a global correlation matrix for the at least two event signals {11} over a first period of time, **{110; p. 2, l. 30-32; p. 3, l. 7-8; p. 5, l. 18-25; Fig. 2}**

a local correlation matrix for the at least two event signals over a second period of time which is shorter than the first period of time, **{120; p.2, l. 32-p. 3, l. 13, p. 3, l. 8-10; p. 5, l. 26-p. 6, l. 7; Fig. 2}**

a correlation vector indicative of a deviation between the local correlation matrix and the global correlation matrix, **{130; p. 3, l. 1-2; p. 3, l. 10-11; p. 6, l. 11-20; Fig. 2}**

an average of the correlation vector, and **{140; p. 3, l. 2-3; p. 3, l. 11; p. 6, l. 21-25; Fig. 2}**

whether an artifact was detected in one of the at least two event signals from the correlation vector and the average of the correlation vector. **{p. 3, l. 4-5; p. 3, l. 11-12;p. 4, l. 14-20; p. 7, l. 1-18}**

2. The device according to Claim 1 wherein said device is a patient monitoring system. **{p. 4, l. 21-26}**

3. The device according to Claim 2 wherein said at least two event signals are monitored patient data signals. **{p. 4, l. 3-9}**

4. A patient monitoring system comprising:

a controller; **{21, p. 3, l. 31; Fig. 1}**

a memory coupled to the controller; **{22; p. 4, l. 28-29; Fig. 1}**

an input interface configured to receive at least two event signals, the at least two event signals being patient monitored data signals; **{11; 20; p. 3, l. 29 - p. 4, l. 2; Fig. 1}**

wherein the controller {21} determines whether an artifact is detected by: **{p. 3, l. 7-8; p. 5, l. 1-5}**

repeatedly determining a global correlation for the at least two event signals over a first period of time, **{110; p. 2 ,l. 30-32;p. 3, l. 7-8; p. 5, l. 18-25; Fig. 2}**

repeatedly determining a local correlation for the at least two event signals over a second period of time which is shorter than the first period of time, **{120; p. 2, l. 32 - p. 3, l. 13, p. 3, l. 8-10; p. 5, l. 26 - p. 6, l. 7; Fig. 2}**

repeatedly determining a current deviation between the local correlation and the global correlation, **{130; p. 3, l. 1-2; p. 3, l. 10-11; p. 6, l. 11-20; Fig. 2}**

determining an average deviation of a plurality of the current deviations, and **{140; p. 3, l. 2-3; p. 3, l. 11; p. 6, l. 21-25; Fig. 2}**

determining whether an artifact was detected in one of the at least two event signals based on a difference between the current deviation and the average deviation; and **{p. 3, l. 4-5; p. 3, l. 11-12; p. 4, l. 14-20; p. 7, l. 1-18}**

an alarm indicator **{40}** coupled to the controller **{21}**, the alarm indicator being triggered if at least one of the event signals **{11}** crosses a preset threshold value and the controller determines that no artifact was detected in the at least one event signal. **{p. 4, l. 30-32; p. 7, l. 15-18; p. 8, cl. 4; Fig. 3}**

5. The device according to Claim 1 further comprising a memory **{22}** for recording the at least two event signals. **{p. 4, l. 28-29}**

6. The device according to Claim 1, wherein said device includes a server **{20}** forming part of a client-server network. **{p. 4, l. 10-11}**

7. A method for detecting a signal artifact in event signals, the method comprising the steps of:

receiving at least two event signals; **{100; p. 5, l. 6-16; Fig. 2}**

determining a global correlation for the at least two event signals over a first period of time; **{110; p. 2, l. 30-32; p. 3, l. 7-8; p. 5, l. 18-25; Fig. 2}**

determining a local correlation for the at least two event signals over a second period of time which is shorter than the first period of time; **{120; p. 2, l. 32-p. 3, l. 13, p. 3, l. 8-10; p. 5, l. 26 - p. 6, l. 7; Fig. 2}**

repeatedly determining a current deviation between the local correlation and the global correlation; **{130; p. 3, l. 1-2; p. 3, l. 10-11; p. 6, l. 11-20; Fig. 2}**

determining an average deviation from a plurality of the determined current deviations; **{140; p. 3, l. 2-3; p. 3, l. 11; p. 6, l. 21-25; Fig. 2}**

comparing the current deviation and the average deviation to determine whether an artifact was detected in one of the at least two event signals; and **{p. 3, l. 4-5; p. 3, l. 11-12; p. 4, l. 14-20; p. 7, l. 1-18}**

triggering an alarm indication in response determining that an artifact was detected. **{p. 8, l. 23-24; p. 4, l. 30-32; p. 7, l. 15-18; p. 8, cl. 4; Fig. 3}**

8. The method according to Claim 7 wherein said method is used with a patient monitoring system. **{p. 4, l. 3-9}**

9. The method according to Claim 8 wherein said at least two event signals are monitored patient data signals. **{p. 4, l. 3-9}**

10. The method according to Claim 9, said method further comprising the step of:

providing the alarm indication in response to at least one of the event signals crossing a preset threshold value and no artifact was detected in the at least one event signal. **{p. 8, l. 23-24}**

11. The method according to Claim 7, said method further comprising the step of:

recording the at least two event signals. **{p. 4, l. 28-29}**

12. The method according to Claim 7, wherein said method is used in a server forming part of a client-server network. **{p. 4, l. 10-11}**

13. A system for detecting a signal artifact in an event signal, comprising:

means for receiving at least two event signals; **{100; p. 5, l. 6-16; Fig. 2}**

means for determining a global correlation for the at least two event signals over a first period of time; **{110; p. 2, l. 30-32; p. 3, l. 7-8; p. 5, l. 18-25; Fig. 2}**

means for determining a local correlation for the at least two event signals over a second period of time which is shorter than the first period of time; **{120; p. 2, l. 32-p. 3, l. 13, p. 3, l. 8-10; p. 5, l. 26 - p. 6, l. 7; Fig. 2}**

means for determining a deviation between a local correlation vector and a global correlation vector; **{130; p. 3, l. 1-2; p. 3, l. 10-11; p. 6, l. 11-20; Fig. 2}**

means for determining an average deviation from the deviation; and **{140; p. 3, l. 2-3; p. 3, l. 11; p. 6, l. 21-25; Fig. 2}**

means for determining whether an artifact was detected in one of the at least two event signals based upon the average deviation. **{p. 3, l. 4-5; p. 3, l. 11-12; p.4, l. 14-20; p. 7, l. 1-18}**

14. The system according to Claim 13 wherein said system is a patient monitoring system. **{p. 4, l. 21-26}**

15. The system according to Claim 14 wherein said at least two event signals are patient monitored data signals. **{p. 4, l. 3-9}**

16. The system according to claim 13 further including:

means for monitoring at least one physiological parameter of a patient and generating the at least two event signals, said at least two event signals conveying patient physiological parameter data. **{p. 4, l. 3-9; p. 4, l. 24-31}**

APPENDIX (Continued)

XII. MEANS OR STEP PLUS FUNCTION ANALYSIS SECTION (41.37(s))

1. (Previously Presented) A device (10) comprising:

a controller; **{21; p. 3, l. 31; Fig. 1}**

a memory coupled to the controller; and **{22; p. 4, l. 28-29; Fig. 1}**

an input interface which receives at least two event signals, **{11; 20; p. 3, l. 29-p. 4, l. 2; Fig. 1}**

wherein the controller {21} determines: **{p. 5, l. 1-5}**

a global correlation matrix for the at least two event signals {11} over a first period of time, **{110; p. 2, l. 30-32; p. 3, l. 7-8; p. 5, l. 18-25; Fig. 2}**

a local correlation matrix for the at least two event signals over a second period of time which is shorter than the first period of time, **{120; p.2, l. 32-p. 3, l. 13, p. 3, l. 8-10; p. 5, l. 26-p. 6, l. 7; Fig. 2}**

a correlation vector indicative of a deviation between the local correlation matrix and the global correlation matrix, **{130; p. 3, l. 1-2; p. 3, l. 10-11; p. 6, l. 11-20; Fig. 2}**

an average of the correlation vector, and **{140; p. 3, l. 2-3; p. 3, l. 11; p. 6, l. 21-25; Fig. 2}**

whether an artifact was detected in one of the at least two event signals from the correlation vector and the average of the correlation vector. **{p. 3, l. 4-5; p. 3, l. 11-12;p. 4, l. 14-20; p. 7, l. 1-18}**

2. The device according to Claim 1 wherein said device is a patient monitoring system. **{p. 4, l. 21-26}**

3. The device according to Claim 2 wherein said at least two event signals are monitored patient data signals. **{p. 4, l. 3-9}**

4. A patient monitoring system comprising:

a controller; **{21, p. 3, l. 31; Fig. 1}**

a memory coupled to the controller; **{22; p. 4, l. 28-29; Fig. 1}**

an input interface configured to receive at least two event signals, the at least two event signals being patient monitored data signals; **{11; 20; p. 3, l. 29 - p. 4, l. 2; Fig. 1}**

wherein the controller {21} determines whether an artifact is detected by: **{p. 3, l. 7-8; p. 5, l. 1-5}**

repeatedly determining a global correlation for the at least two event signals over a first period of time, **{110; p. 2 ,l. 30-32;p. 3, l. 7-8; p. 5, l. 18-25; Fig. 2}**

repeatedly determining a local correlation for the at least two event signals over a second period of time which is shorter than the first period of time, **{120; p. 2, l. 32 - p. 3, l. 13, p. 3, l. 8-10; p. 5, l. 26 - p. 6, l. 7; Fig. 2}**

repeatedly determining a current deviation between the local correlation and the global correlation, **{130; p. 3, l. 1-2; p. 3, l. 10-11; p. 6, l. 11-20; Fig. 2}**

determining an average deviation of a plurality of the current deviations, and **{140; p. 3, l. 2-3; p. 3, l. 11; p. 6, l. 21-25; Fig. 2}**

determining whether an artifact was detected in one of the at least two event signals based on a difference between the current deviation and the average deviation; and **{p. 3, l. 4-5; p. 3, l. 11-12; p. 4, l. 14-20; p. 7, l. 1-18}**

an alarm indicator **{40}** coupled to the controller **{21}**, the alarm indicator being triggered if at least one of the event signals **{11}** crosses a preset threshold value and the controller determines that no artifact was detected in the at least one event signal. **{p. 4, l. 30-32; p. 7, l. 15-18; p. 8, cl. 4; Fig. 3}**

5. The device according to Claim 1 further comprising a memory **{22}** for recording the at least two event signals. **{p. 4, l. 28-29}**

6. The device according to Claim 1, wherein said device includes a server **{20}** forming part of a client-server network. **{p. 4, l. 10-11}**

7. A method for detecting a signal artifact in event signals, the method comprising the steps of:

receiving at least two event signals; **{100; p. 5, l. 6-16; Fig. 2}**

determining a global correlation for the at least two event signals over a first period of time; **{110; p. 2, l. 30-32; p. 3, l. 7-8; p. 5, l. 18-25; Fig. 2}**

determining a local correlation for the at least two event signals over a second period of time which is shorter than the first period of time; **{120; p. 2, l. 32-p. 3, l. 13, p. 3, l. 8-10; p. 5, l. 26 - p. 6, l. 7; Fig. 2}**

repeatedly determining a current deviation between the local correlation and the global correlation; **{130; p. 3, l. 1-2; p. 3, l. 10-11; p. 6, l. 11-20; Fig. 2}**

determining an average deviation from a plurality of the determined current deviations; **{140; p. 3, l. 2-3; p. 3, l. 11; p. 6, l. 21-25; Fig. 2}**

comparing the current deviation and the average deviation to determine whether an artifact was detected in one of the at least two event signals; and **{p. 3, l. 4-5; p. 3, l. 11-12; p. 4, l. 14-20; p. 7, l. 1-18}**

triggering an alarm indication in response determining that an artifact was detected. **{p. 8, l. 23-24; p. 4, l. 30-32; p. 7, l. 15-18; p. 8, cl. 4; Fig. 3}**

8. The method according to Claim 7 wherein said method is used with a patient monitoring system. **{p. 4, l. 3-9}**

9. The method according to Claim 8 wherein said at least two event signals are monitored patient data signals. **{p. 4, l. 3-9}**

10. The method according to Claim 9, said method further comprising the step of:

providing the alarm indication in response to at least one of the event signals crossing a preset threshold value and no artifact was detected in the at least one event signal. **{p. 8, l. 23-24}**

11. The method according to Claim 7, said method further comprising the step of:

recording the at least two event signals. **{p. 4, l. 28-29}**

12. The method according to Claim 7, wherein said method is used in a server forming part of a client-server network. **{p. 4, l. 10-11}**

13. A system for detecting a signal artifact in an event signal, comprising:

means for receiving at least two event signals; **{100; p. 5, l. 6-16; Fig. 2}**

means for determining a global correlation for the at least two event signals over a first period of time; **{110; p. 2, l. 30-32; p. 3, l. 7-8; p. 5, l. 18-25; Fig. 2}**

means for determining a local correlation for the at least two event signals over a second period of time which is shorter than the first period of time; **{120; p. 2, l. 32-p. 3, l. 13, p. 3, l. 8-10; p. 5, l. 26 - p. 6, l. 7; Fig. 2}**

means for determining a deviation between a local correlation vector and a global correlation vector; **{130; p. 3, l. 1-2; p. 3, l. 10-11; p. 6, l. 11-20; Fig. 2}**

means for determining an average deviation from the deviation; and **{140; p. 3, l. 2-3; p. 3, l. 11; p. 6, l. 21-25; Fig. 2}**

means for determining whether an artifact was detected in one of the at least two event signals based upon the average deviation. **{p. 3, l. 4-5; p. 3, l. 11-12; p.4, l. 14-20; p. 7, l. 1-18}**

14. The system according to Claim 13 wherein said system is a patient monitoring system. **{p. 4, l. 21-26}**

15. The system according to Claim 14 wherein said at least two event signals are patient monitored data signals. **{p. 4, l. 3-9}**

16. The system according to claim 13 further including:

means for monitoring at least one physiological parameter of a patient and generating the at least two event signals, said at least two event signals conveying patient physiological parameter data. **{p. 4, l. 3-9; p. 4, l. 24-31}**

APPENDIX (Continued)

XIII. EVIDENCE SECTION (41.37(t))

None.

APPENDIX (Continued)

XIV. RELATED CASES SECTION (41.37(u))

None.